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M	T	E	T	A	Y	G	N	A	Q	D	L	L	V	E	WT-ROS
M	T	E	T	A	Y	G	N	A	Q	D	L	L	V	E	SYNROS
M	T	D	M	A	T	G	N	A	P	E	L	L	V	E	ROS-R
M	T	E	T	A	Y	G	N	A	Q	D	L	L	V	E	ROS-AR
M	T	E	T	<u>S</u>	<u>L</u>	G	<u>T</u>	<u>S</u>	<u>N</u>	<u>E</u>	L	L	V	E	MUC-R
L	T	A	D	I	V	A	A	Y	V	S	N	H	V	V	WT-ROS
L	T	A	D	I	V	A	A	Y	V	S	N	H	V	V	SYNROS
L	T	A	D	I	V	A	A	Y	V	S	N	H	V	V	ROS-R
L	T	A	D	I	V	A	A	Y	V	S	N	H	V	V	ROS-AR
L	T	A	E	I	V	A	A	Y	V	S	N	H	V	V	MUC-R
P	V	T	E	L	P	G	L	I	S	D	V	H	T	A	WT-ROS
P	V	T	E	L	P	G	L	I	S	D	V	H	T	A	SYNROS
P	V	S	D	L	A	N	L	I	S	D	V	H	S	A	ROS-R
P	V	T	E	L	P	G	L	I	S	D	V	H	S	A	ROS-AR
P	V	<u>A</u>	<u>E</u>	<u>L</u>	<u>P</u>	<u>T</u>	<u>L</u>	<u>I</u>	<u>A</u>	<u>D</u>	<u>V</u>	<u>H</u>	<u>S</u>	A	MUC-R
L	S	G	T	S	A	P	A	S	V	A	V	N	V	E	WT-ROS
L	S	G	T	S	A	P	A	S	V	A	V	N	V	E	SYNROS
L	S	N	T	S	V	P	Q	P	A	A	V	N	V	E	ROS-R
L	S	G	T	S	A	P	A	S	V	A	V	N	V	E	ROS-AR
L	N	N	T	<u>T</u>	<u>A</u>	<u>P</u>	<u>A</u>	<u>P</u>	<u>V</u>	<u>V</u>	<u>V</u>	<u>P</u>	<u>V</u>	E	MUC-R
K	Q	K	P	A	V	S	V	R	K	S	V	Q	D	D	WT-ROS
K	Q	K	P	A	V	S	V	R	K	S	V	Q	D	D	SYNROS
K	Q	K	P	A	V	S	V	R	K	S	V	Q	D	E	ROS-R
K	Q	K	P	A	V	S	V	R	K	S	V	Q	D	D	ROS-AR
K	<u>P</u>	K	P	A	V	S	V	R	K	S	V	Q	D	<u>D</u>	MUC-R
H	I	V	C	L	E	C	G	G	S	F	K	S	L	K	WT-ROS
H	I	V	C	L	E	C	G	G	S	F	K	S	L	K	SYNROS
Q	I	T	C	L	E	C	G	G	N	F	K	S	L	K	ROS-R
H	I	V	C	L	E	C	G	G	S	F	K	S	L	K	ROS-AR
Q	I	T	C	L	E	C	G	G	T	F	K	S	L	K	MUC-R
R	H	L	T	T	H	H	S	M	T	P	E	E	Y	R	WT-ROS
R	H	L	T	T	H	H	S	M	T	P	E	E	Y	R	SYNROS
R	H	L	M	T	H	H	S	L	S	P	E	E	Y	R	ROS-R
R	H	L	T	T	H	H	S	M	T	P	E	E	Y	R	ROS-AR
R	H	L	M	T	H	H	<u>N</u>	L	S	P	E	E	Y	R	MUC-R
E	K	W	D	L	P	V	D	Y	P	M	V	A	P	A	WT-ROS
E	K	W	D	L	P	V	D	Y	P	M	V	A	P	A	SYNROS
E	K	W	D	L	P	T	D	Y	P	M	V	A	P	A	ROS-R
E	K	W	D	L	Q	V	D	Y	P	M	V	A	P	A	ROS-AR
D	K	W	D	L	P	A	D	Y	P	M	V	A	P	A	MUC-R
Y	A	E	A	R	S	R	L	A	K	E	M	G	L	G	WT-ROS
Y	A	E	A	R	S	R	L	A	K	E	M	G	L	G	SYNROS
Y	A	E	A	R	S	R	L	A	K	E	M	G	L	G	ROS-R
Y	A	E	A	R	S	R	L	A	K	E	M	G	L	G	ROS-AR
Y	A	E	A	R	S	R	L	A	K	E	M	G	L	G	MUC-AR
Q	R	R	K	A	N	R	P	K	K	K	R	K	V		WT-ROS
Q	R	R	K	A	N	R	P	K	K	K	R	K	V		SYNROS
Q	R	R	K	R	G	R	G	K	K	K	R	K	V		ROS-R
Q	R	R	K	A	N	R	G	K	K	K	R	K	V		ROS-AR
Q	R	R	K	R	K	R	G	K	K	K	R	K	V		MUC-AR

FIG. 1A

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<u>GCGGATCCCC</u>	<u>GGGTATGACT</u>	<u>GAGACTGCTT</u>	<u>ACGGTAACGC</u>
TCAGGATCTT	CTTGTTGAGC	TTACTGCTGA	TATCGTTGCT
GCTTACGTTT	CTAACCAACGT	TGTTCCCTGTT	ACTGAGCTTC
CTGGACTTAT	CTCTGATGTT	CATACTGCAC	TTTCTGGAAC
ATCTGCTCCT	GCTTCTGTTG	CTGTTAACGT	TGAGAAGCAG
AAGCCTGCTG	TTTCTGTTCG	TAAGTCTGTT	CAGGATGATC
ATATCGTTG	TTTGGAGTGT	GGTGGTTCTT	TCAAGTCTCT
CAAGCGTCAC	CTTACTACTC	ATCACCTAT	GAUTCCAGAG
GAGTATAGAG	AGAAAGTGGGA	TCTTCCTGTT	GATTACCCTA
TGGTTGCTCC	TGCTTACGCT	GAGGCTCGTT	CTCGTCTCGC
TAAGGAGATG	GGTCTCGGTC	AGCGTCGTA	GGCTAACCGT
CCAAAAAAAGA	AGCGTAAGGT	CTGAGAGCTC	GC

**FIG. 1B**

M T E T A Y G N A Q D L L V E  
ATG ACN GAR ACN GCN TAY GGN AAY GCN CAR GAY YTN YTN GTN GAR

L T A D I V A A Y V S N H V V  
YTN ACN GCN GAY ATH GTN GCN GCN TAY GTN WSN AAY CAY GTN GTN

P V T E L P G L I S D V H T A  
CCN GTN ACN GAR YTN CCN GGN YTN ATH WSN GAY GTN CAY ACN GCN

L S G T S A P A S V A V N V E  
YTN WSN GGN ACN WSN GCN CCN GCN WSN GTN GCN GTN AAY GTN GAR

K Q K P A V S V R K S V Q D D  
AAR CAR AAR CCN GCN GTN WSN GTN MGN AAR WSN GTN CAR GAY GAY

H I V C L E C G G S F K S L K  
CAY ATH GTN TGY YTN GAR TGY GGN GGN WSN TTY AAR WSN YTN AAR

R H L T T H H S M T P E E Y R  
MGN CAY YTN ACN ACN CAY CAY WSN ATG ACN CCN GAR GAR TAY MGN

E K W D L P V D Y P M V A P A  
GAR AAR TGG GAY YTN CCN GTN GAY TAY CCN ATG GTN GCN CCN GCN

Y A E A R S R L A K E M G L G  
TAY GCN GAR GCN MGN WSN MGN YTN GCN AAR GAR ATG GGN YTN GGN

Q R R K A N R P K K K R K V  
CAR MGN MGN AAR GCN AAY MGN CCN AAR AAR AAR MGN AAR GTN

FIG. 1C

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Docket No.: 00270.0078USWO  
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**WO 03/104462** Attorney Name: Gregory A. Sebald  
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ROS Inverted Repeat  
DNA Binding Sites (Operator sequences)

**TATATTCAA-TTTA-TTGTAATATA** *virC/virD*  
\*\*\*\*\* \* \* \* \* \* \* \* \* \*  
**TATAATTAAAATATTAACGTGTCGCATT** *ipt*

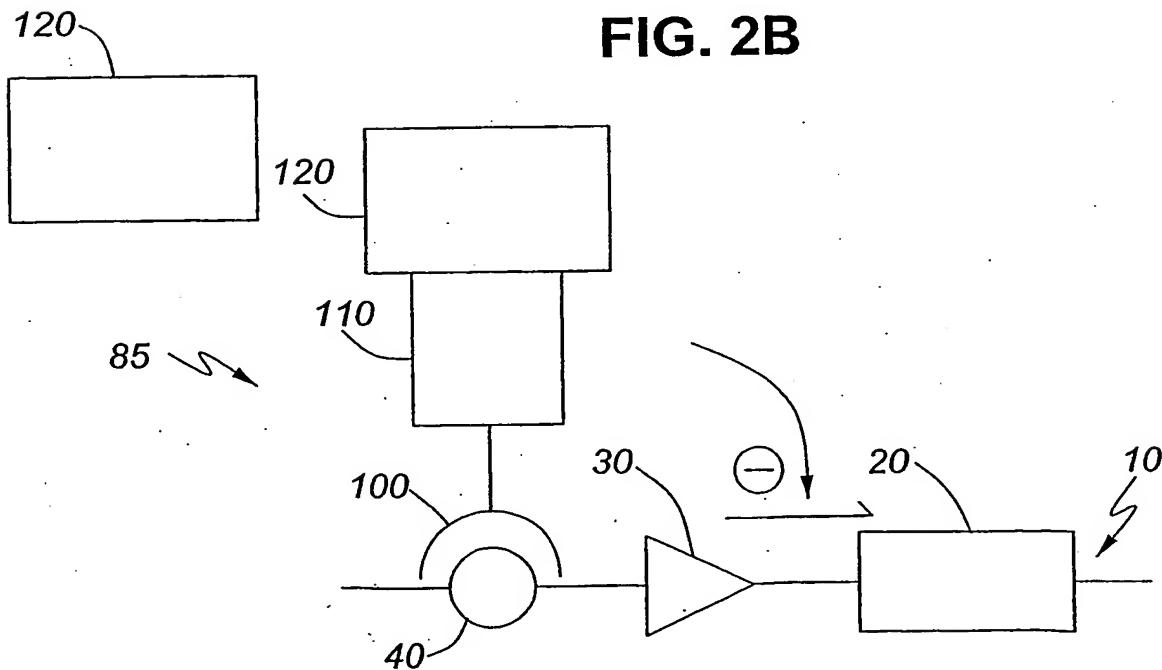
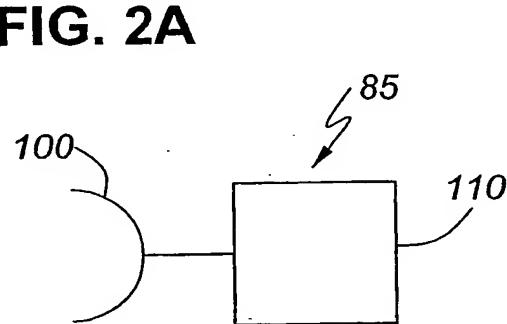
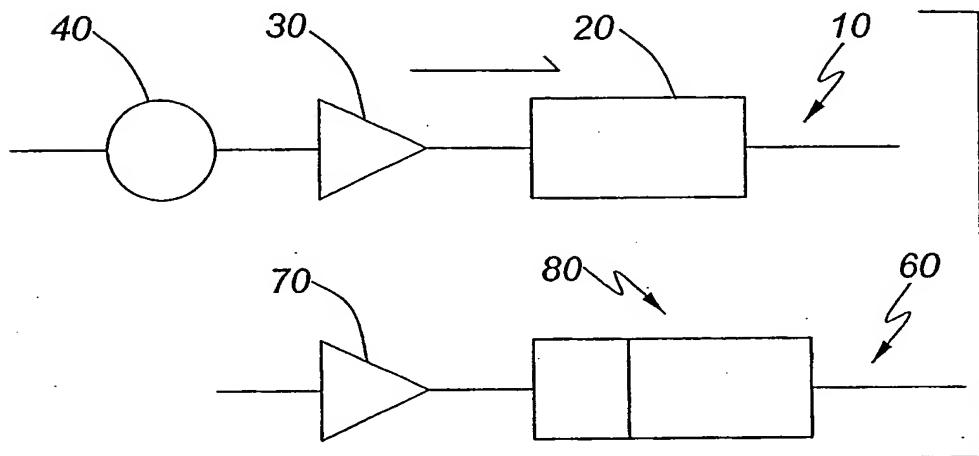
**FIG. 1D**

Comparison of ROS DNA Binding Site (Operator) Sequences

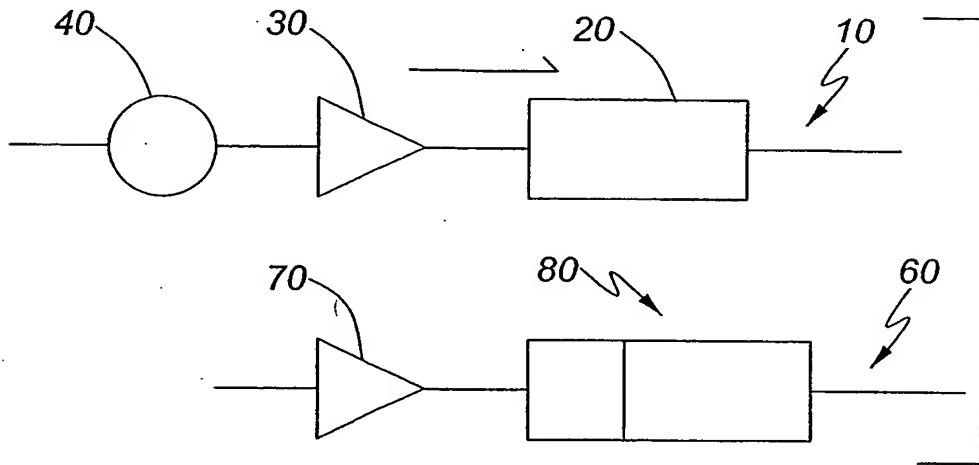
<i>VirC/VirD</i>	<b>TATATTCAA</b>
	<b>TATATTACAA</b>
<i>ipt</i>	<b>TATAATTAAA</b>
	<b>AATGCGACAG</b>
	<b>TATAHTtCAA</b>
	a g gaa g
<b>Consensus</b>	<b>WATDHWMAR</b>

**FIG. 1E**

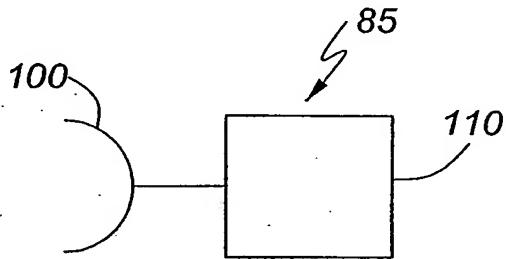
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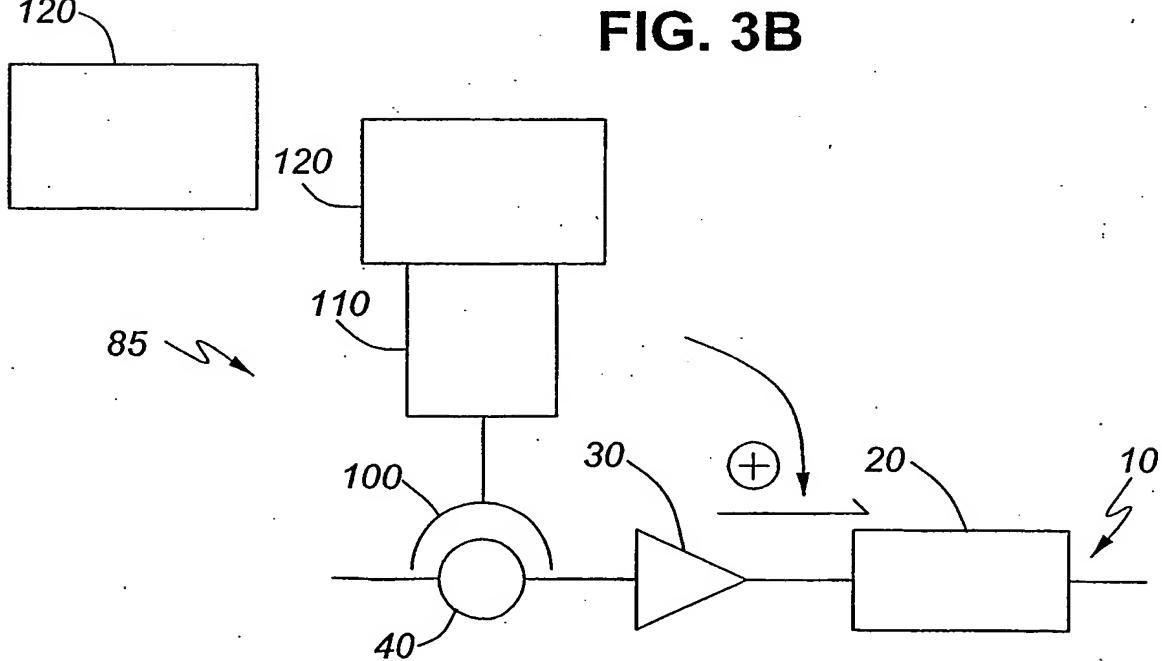
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**FIG. 3A**



**FIG. 3B**



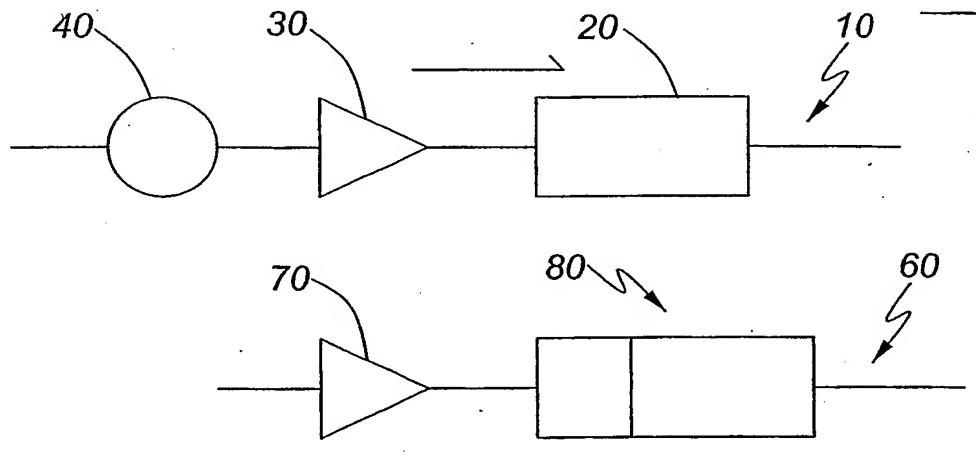
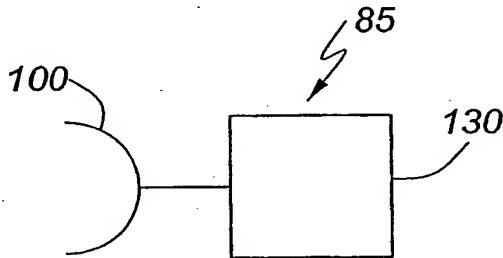
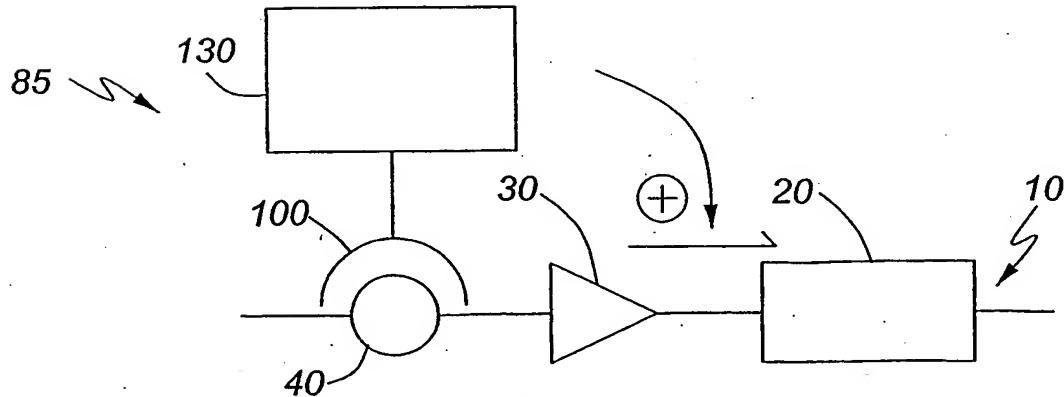
**FIG. 3C**

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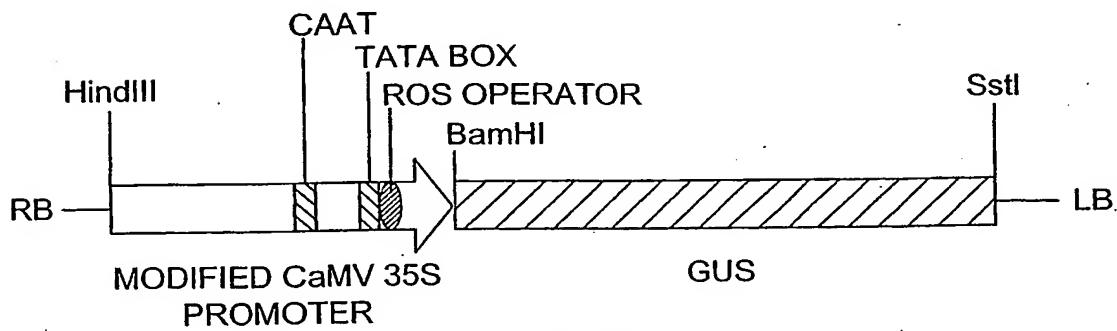
**FIG. 4A****FIG. 4B****FIG. 4C**

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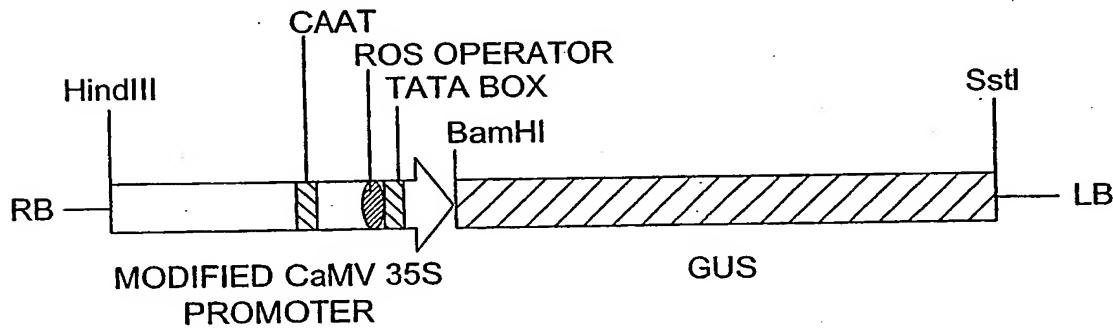
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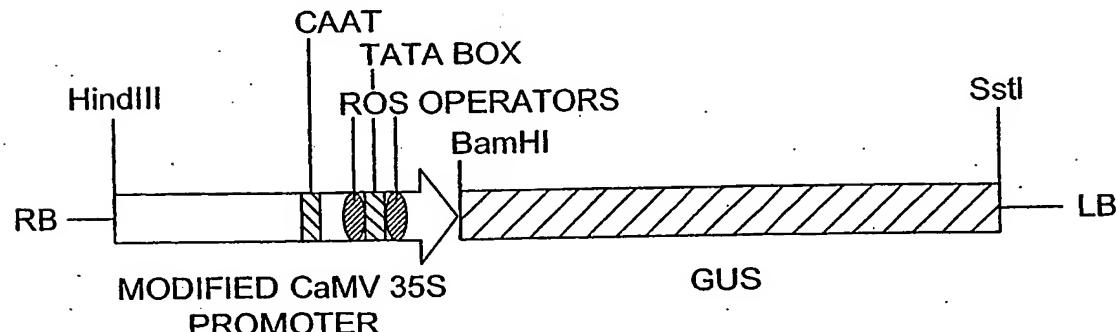
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p74-315

**FIG. 5A**

p74-316

**FIG. 5B**

p74-309

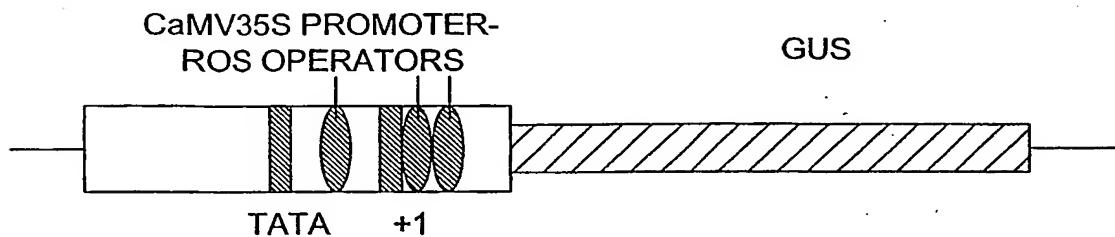
**FIG. 5C**

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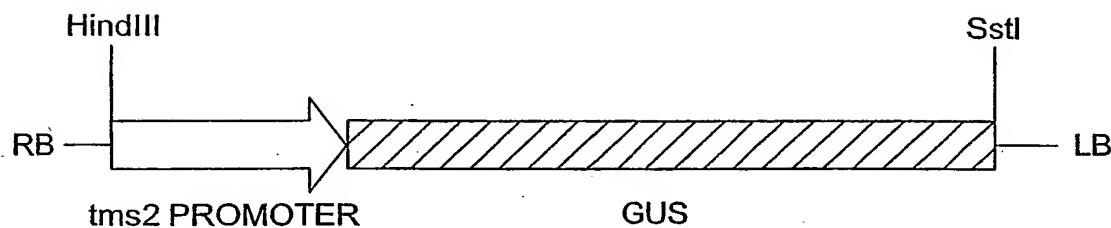
**FIG. 5D**

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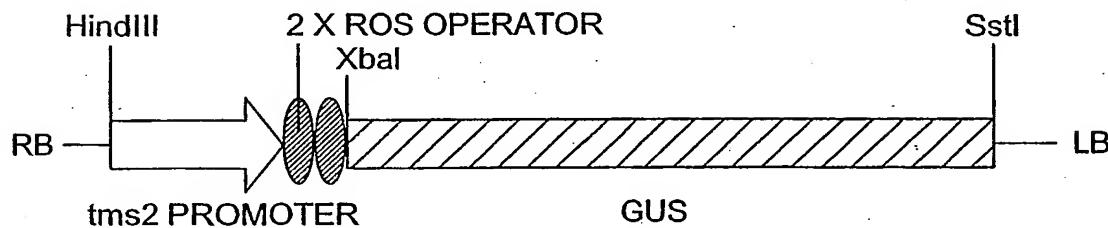
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p76-507  
**FIG. 6A**



p76-508  
**FIG. 6B**

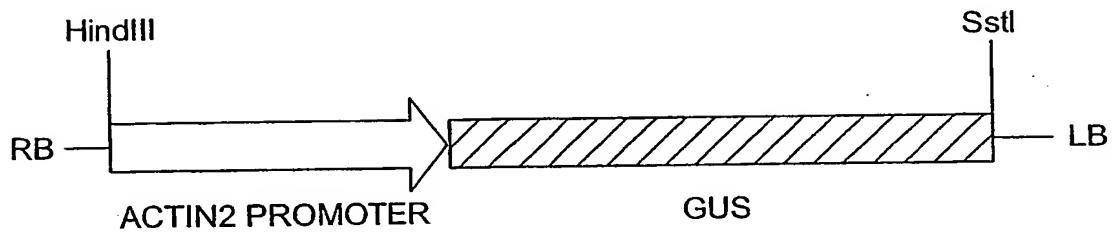
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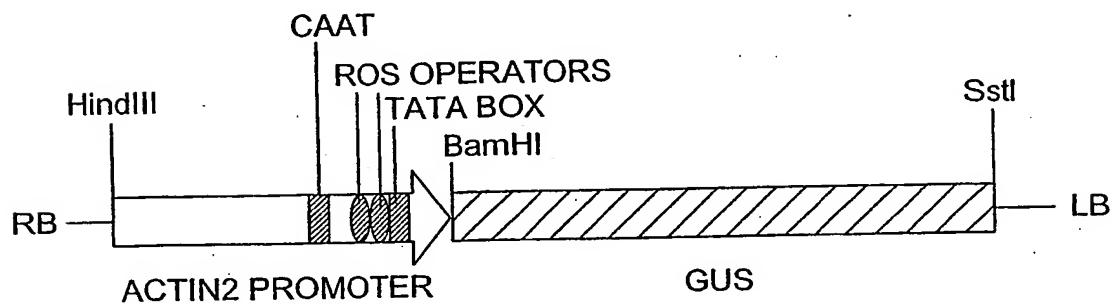
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p75-101

**FIG. 7A**



p74-501

**FIG. 7B**

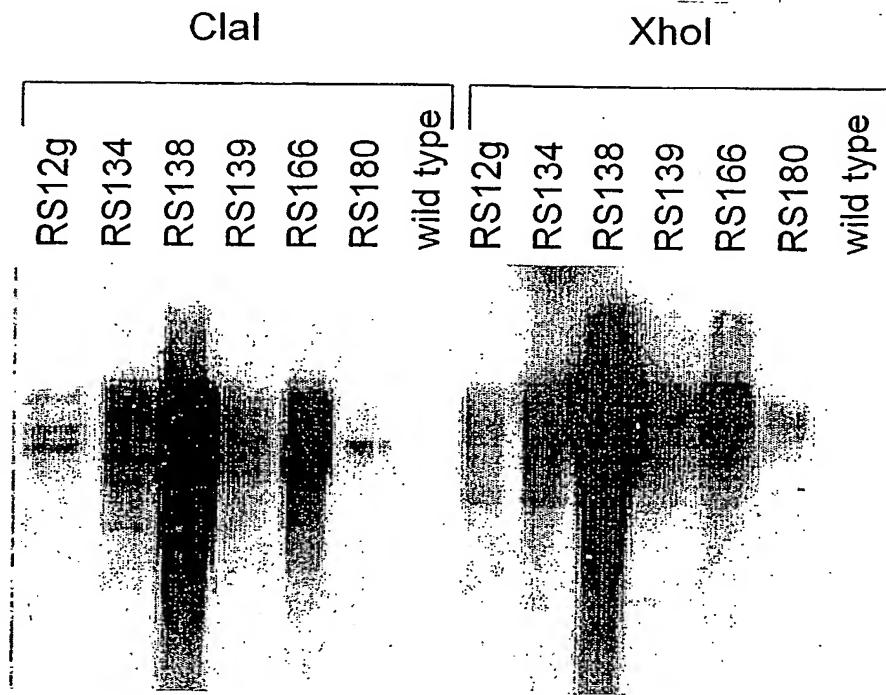
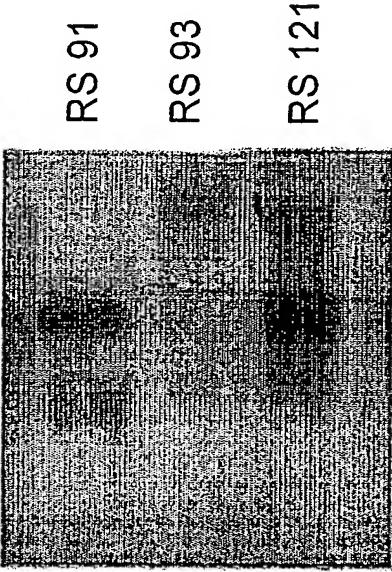


FIG. 8A

P74-101



**FIG. 8B**

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FIG. 9

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bnKCP (1) M-AGGGPTFSIELSAYG-SDLPTDKASGDIP-----NEEGSGLSRVGSGIWI  
atKCP (1) MELMAKPTFSIEVSQYGTIDLATEKASSSSSFETTNEEG-VEESGLSRIW  
atKCL1 (1) M-----EVLVGSTFRDRSSVTTHDQAVP-----AS-LSSRIGLRRC  
atKCL2 (1) M---VGSSFGIGMAAYVRDHRGVSAQDKAVQTALFLADESGRGGSQIGIGLR

bnKCP (45) SG----RTVDYSSESSSSIGTPGDSEEDEESEEDNDEEEL-----GLASL  
atKCP (52) SG----QTADYSSDSSS-IGTPGDSEEDEESENENDVSSKELGLRGLASM  
atKCL1 (36) GR-----SPPPESSSSVGETSENEEDEDDAVSSSQGRWLNS-----SFS  
atKCL2 (50) MSNNNNKSPPEESSDSSSIGESSENEEEEEEEDDAVSCQRGTLD-----SFS

\*\*\*\*\*

bnKCP (87) RSLEDSLPSK-GLSSHYKGKSFKGNLGEIG-SVKEVPKQENPLNKRRRLQI  
atKCP (99) SSLEDSLPSKRGLSNHYKGKSFKGNLGEIG-SVKEVAKQENPLNKRRRLQI  
atKCL1 (74) SSLEDSLPIKRGLSNHYIGKSFKGNLMEAS-NTNDLVKVESPLNKRRRLII  
atKCL2 (96) SSLEDSLPIKRGLSNHYVGKSFKGNLMEASKAKDLEKVENPNKRRRLVI

bnKCP (137) YNKLARKS-----FYSWQNPKSMPLLPVHEDNDDEEGDDG-----  
atKCP (150) CNKLARKS-----FYSWQNPKSMPLLPVNEDDEDDDEDDDEEDLKSGFDEN  
atKCL1 (125) ANKLRRRSSLSSFSIYTKINPNNSMPLLALQESDNEDHKLNDDDDDDS--S  
atKCL2 (148) ANKLRRR-----GRSITYEEDHHIHNDDYEDDDG-----

♦♦♦

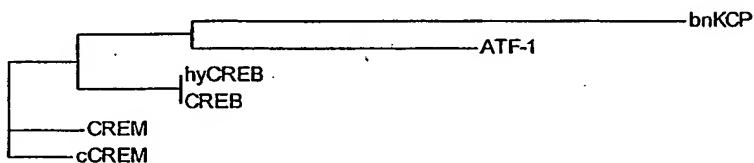
bnKCP (172) -DLSDEERGGDVLRPSFKNRALKSMSCFALSDLQEEEE----EEEDE  
atKCP (196) KSSSDEEGVKVVVRKGSKRNRAYKSRSCFALSDLIEED---DDDDQ  
atKCL1 (174) SDDETSKLKEKRMKMTNHRDFMVPQTKSCFSLTSFQDDDDR-----  
atKCL2 (177) ----DGDDHRKIMMMKNKELMAQTRSCFCCLSSLQEEEDDGDDDEDE

FIG. 10A

**Fig. 10B**

♦♦♦♦  
bnKCP      GDDGDLSDDEERGGDVLARRPSFKNRALKSMSCFALSDLQEEE  
ATF-1      DSSDSIGSSQQAHGILARRPSYRKILKDLSSEDTRGRKGDGEE  
hyCREB      ESVDSVTDSQKRREILSRRPSYRKILNLDLSSDAPGVPRIEEE  
CREB      ESVDSVTDSQKRREILSRRPSYRKILNLDLSSDAPGVPRIEEE  
CREM      SADSEVIDSHKRREILSRRPSYRKILNELSSDVPGIPKIEEEE  
cCREM      AESEGVIDSHKRREILSRRPSYRKILNELSSDVPGVPKIEEEE

**Fig. 10C**



**FIG. 10**

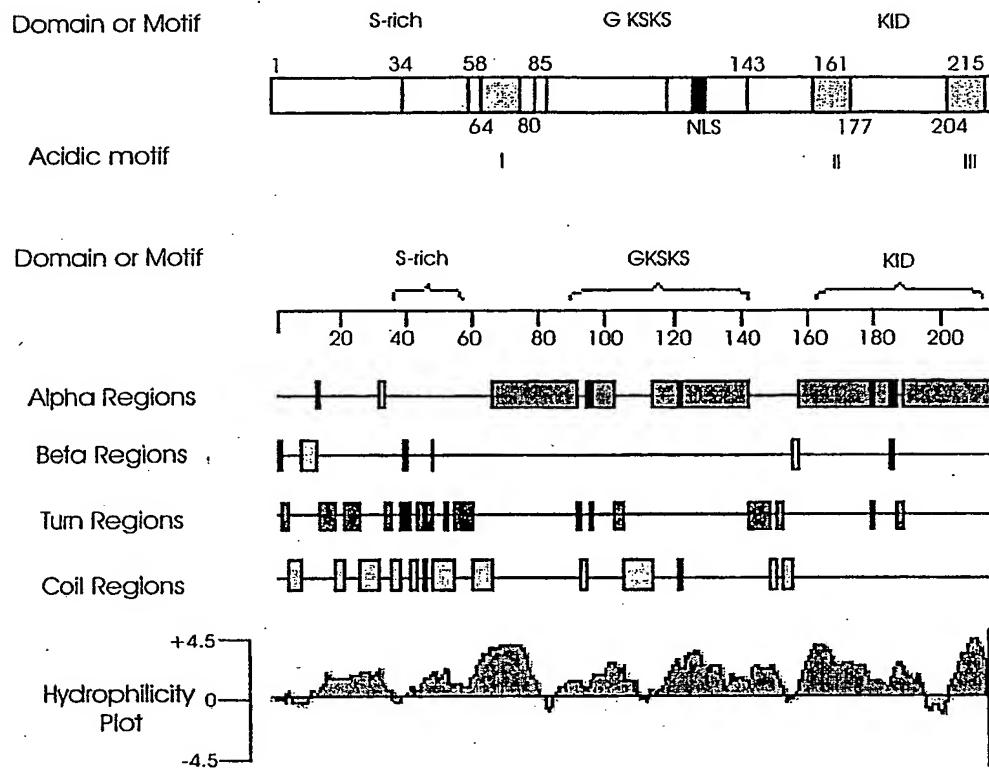


FIG. 11

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E I X H P E V K



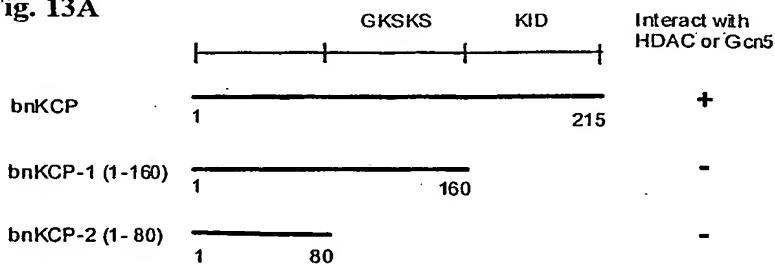
**FIG. 12**

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**Fig. 13A****Fig. 13B**

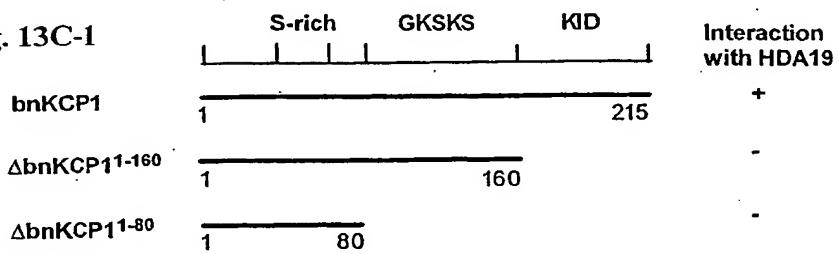
	10% input	GST-HDAC	GST-Gcn5	GST
bnKCP	+	+	+	+
bnKCP-1 (1-160)	+	+	+	+
bnKCP-2 (1-80)	+	+	+	+
no template	+			
luciferase	+			

**FIG. 13**

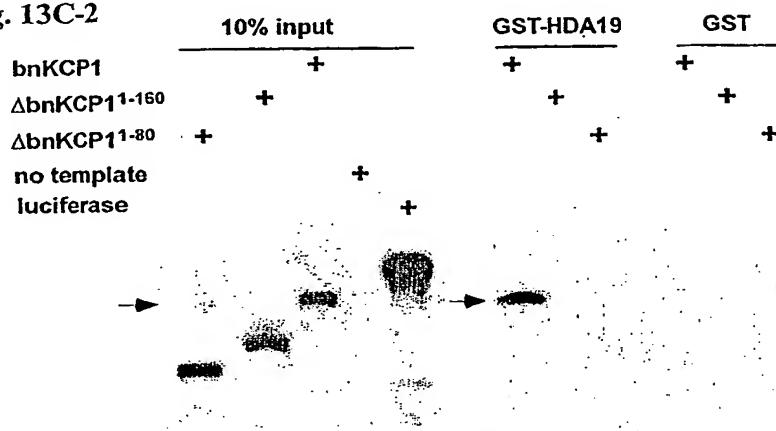
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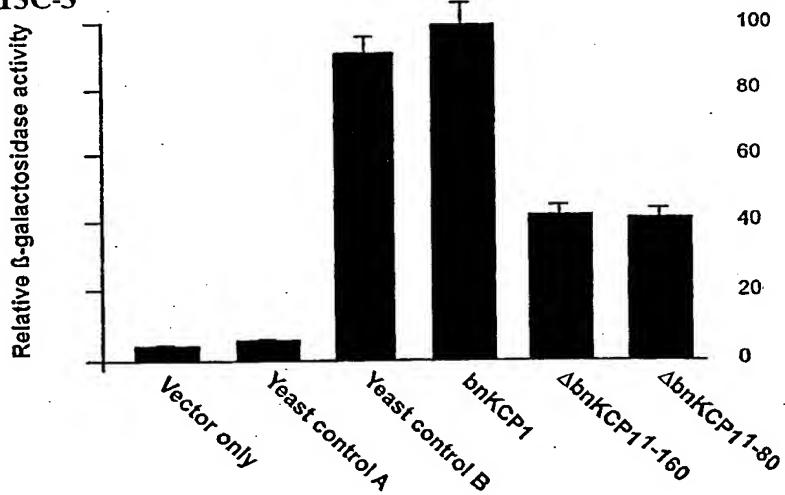
**Fig. 13C-1**



**Fig. 13C-2**



**Fig. 13C-3**



**FIG. 13 cont'd**

Fig. 14A

Wild type KID GDDGDLSDDEERGGDVLR~~RPS~~<sup>S</sup>FKNRALKSMSCFALSDLQEEE  
(RRPS<sup>188</sup>)



Mutant KID GDDGDLSDDEERGGDVLR~~RPS~~<sup>G</sup>FKNRALKSMSCFALSDLQEEE  
(RRPG<sup>188</sup>)

Fig. 14B

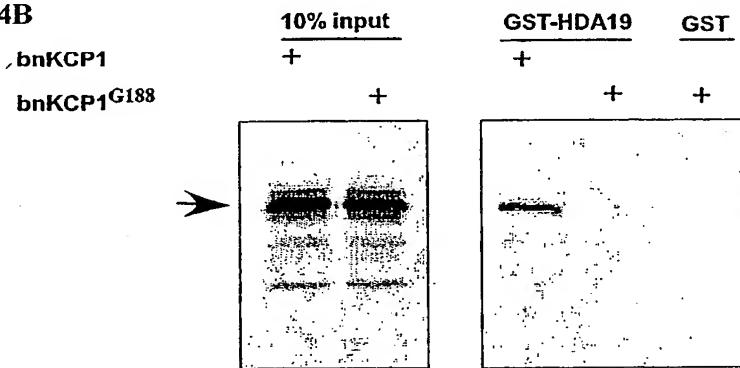
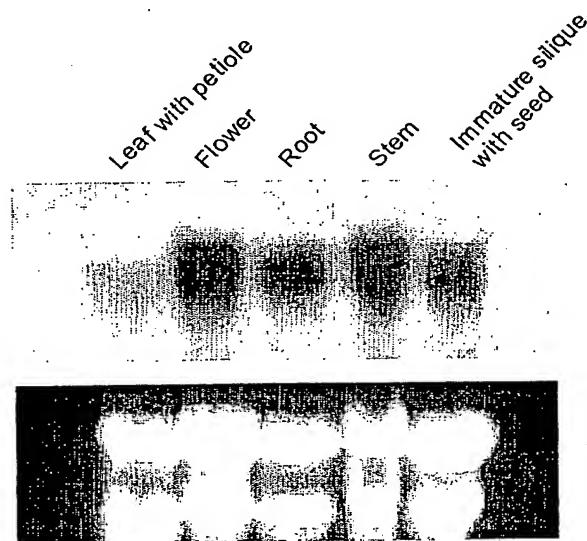


FIG. 14



**FIG. 15**

Fig. 16A

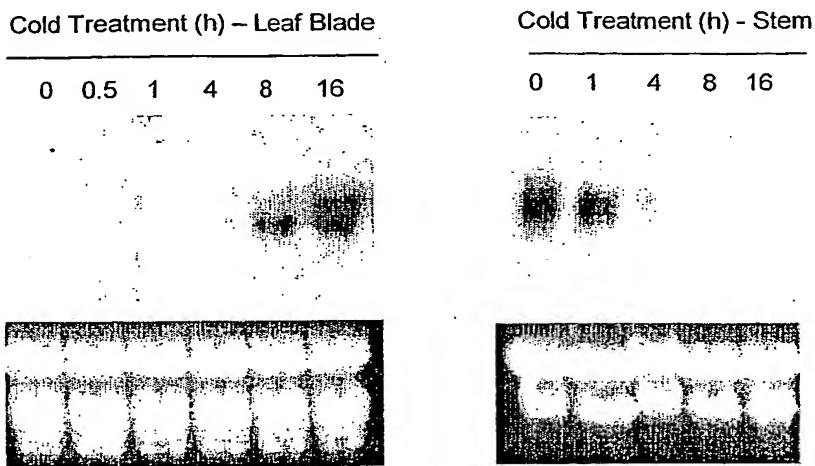


Fig. 16B

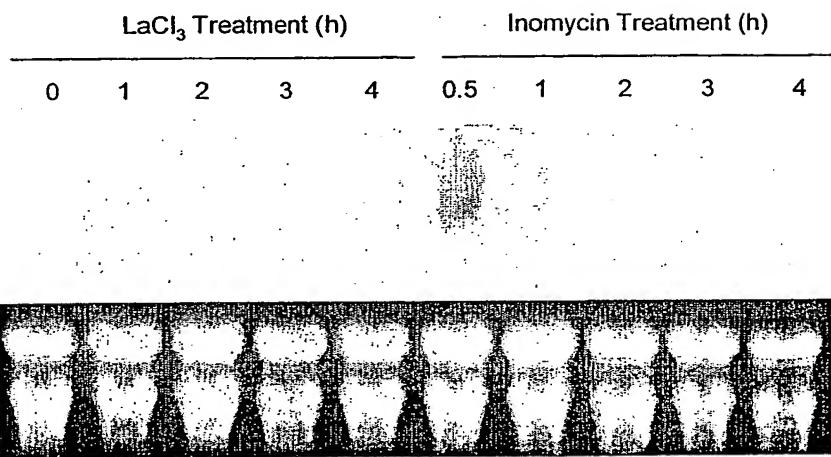
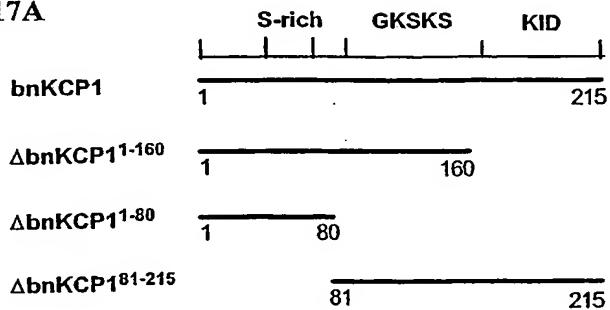
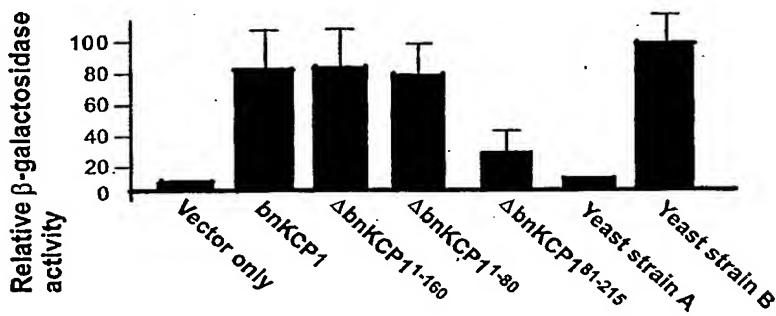


FIG. 16

**Fig. 17A****Fig. 17B****FIG. 17**

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Inventor: HANNOUFA et al.  
Docket No.: 00270.0078USWO  
Title: REGULATION OF GENE EXPRESSION USING CHROMATIN REMODELLING  
FACTORS  
Attorney Name: Gregory A. Sebald  
Phone No.: 612.336.4728  
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Fig. 18A

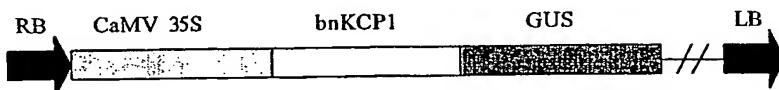


Fig. 18B

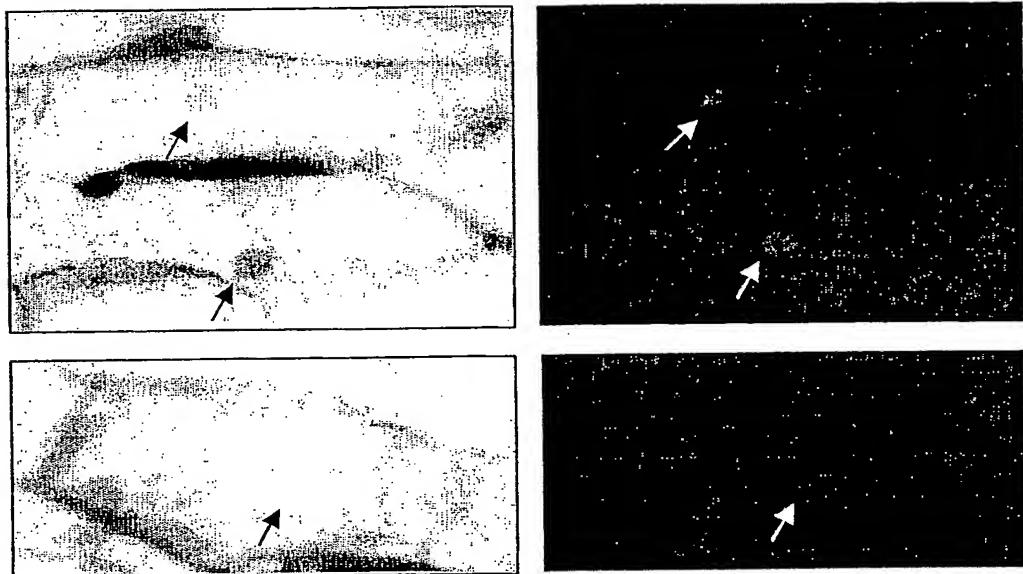


FIG. 18

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Inventor: HANNOUFA et al.  
Docket No.: 00270.0078USWO  
Title: REGULATION OF GENE EXPRESSION USING CHROMATIN REMODELLING FACTORS  
Attorney Name: Gregory A. Sebald  
Phone No.: 612.336.4728  
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## Strategy for cloning zinc finger domain fusion with KID

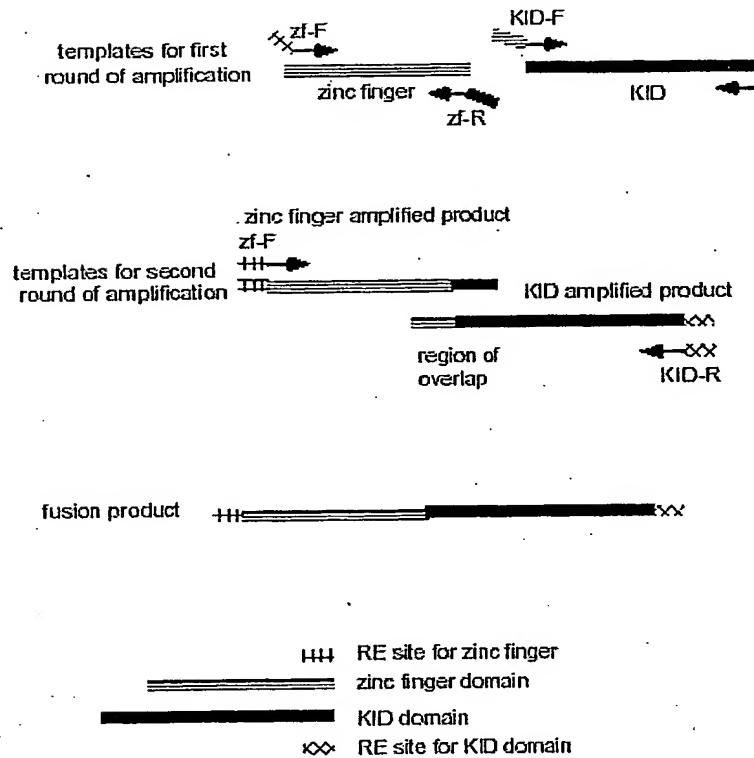


FIG. 19

BnSCL1	(1)	<b>MKLOASSPODNQ</b>	-----PSNE-----	
AtSCL15	(1)	<b>MKIIPASSPODTT</b>	-----NNNN-----	
LeSCL	(1)	<b>MKVPESTNDNVSSKPLVNSN</b>	<b>NSFTFPAAATNGSNLCYEPKSVLELRRSPSP</b>	
BnSCL1	(17)	-----TNNSTDNSNHLSMDDEHMR	SMDWDSIMKELEVDDDSA	
AtSCL15	(17)	-----NTNSTDSNHLSMDDEHVMR	SMDWDSIMKELELDDDSA	
LeSCL	(51)	IVDKQIITTNPDLSALCGGEDPLQLGDH	VLSNFEDWDDSLMLRELGLHDDSA	
BnSCL1	(53)	<b>PYDLOP</b> ---S-----S	FNLPVFPD-----IDSSDVYEGPN	
AtSCL15	(53)	PNSIKTGF	TTTCDSTILPLYAVDSNLPGFPDQIQPSDFESSSDVYEGPN	
LeSCL	(101)	SLSKTNPLTHSESLTQFHN	SEFSABSNQFPSPDFSFSDTNFRQQEPTVN	
BnSCL1	(80)	<b>OITGYGENSLDSVDNG</b>	GFDYLEDLIRVVDCIESDELHLAHVVL	SCL
AtSCL15	(103)	<b>OITGYGENSLDSVDNG</b>	GFDYLEDLIRVVDCVESDELOLOLAQVVL	SRL
LeSCL	(151)	<b>QASFNALELSGDIHQNWV</b>	<b>GFDYVDELIRFAECETNAFOLAHVILARL</b>	
LHRI				
BnSCL1	(126)	NORLOTSAGRPLQRAAFYFKEALGSIL	LGTGNRN	-----OIFSWSDIVOKIRAI
AtSCL15	(149)	NORLRSAGRPLQRAAFYFKEALGSIL	TGSNRNPIRLSSWSEIVOKIRAI	
LeSCL	(201)	NORLRSAGKPLQRAAFYFKEALQAOLAGSAROT	RSSSSSDVIOHJIKSY	
*****				
BnSCL1	(174)	KEFSGISPIPLFSHFTANOAILLDSLSSOSS	SPEVHVVD	FEIGFGGOYASL
AtSCL15	(199)	KEYSGISPIPLFSHFTANOAILLDSLSSOSS	SPEVHVVD	FEIGFGGOYASL
LeSCL	(250)	KIISNISIPMFSFTANOAVLEAVDG	SMVHVVIDFDIGGGHWAS	
VIIID				
BnSCL1	(224)	MREIAEKS	ANGGLRVTAWVAEDCAVETRLVKENLTQFAAEMKIRF	
AtSCL15	(249)	MREITEKS	VSGGLRVTAWVAEDCAVETRLVKENLTQFAAEMKIRF	
LeSCL	(297)	MKEIADKAECRKAANAPILRITALVPEYAVESRLIRENLTOFAELNIGE		
LHRII				
BnSCL1	(270)	QIEFVLMKTFEILSFKAIRFVDGERTVL	ISPAIFRRVIGIAEFVN	NLGR
AtSCL15	(295)	QIEFVLMKTFEILSFKAIRFVEGERTVL	ISPAIFRRLSG	ITDEVNNLRR
LeSCL	(347)	EIDFVLIITFELL	LSFKAIKFMEGEKTPVLL	ISPAIFRRVG-SGFVNELRR
*****				
BnSCL1	(320)	VSPIVVVFVDSEGCTETAGSGSFRREEVSAEEFY	TMVLESIDAAAPPG	
AtSCL15	(345)	VSPIVVVFVDSEGWTETAGSGSFRREEVSAEEFY	TMVLESIDAAAPPG	
LeSCL	(395)	ISPVVVFVDSEGGLMGYG-AMSFRTVIDGLEFY	STLLESIEAANIGGN	
PFYRE				
BnSCL1	(368)	-DLVKKLIVETFLLRPKISA	AVETAANRRSAGOMTWREMLCAAGMRPVOLS	
AtSCL15	(393)	-DLVKKLIVEAFLRPKISA	AVETAADRRHTGEMTWREABCAGMRPIQOS	
LeSCL	(444)	CEDWMRKIE	FLFPKIVDMIGAVG-RRGGGSWRDAMVDA	GERPVGES
*****				
BnSCL1	(417)	QFADFOAECLLEKAQVRFHVA	KROGELVLCWHGRALVATS	AWRC
AtSCL15	(442)	QFADFOAECLLEKAQVRFHVA	KROGELVLCWHGRALVATS	AWRC
LeSCL	(492)	QFADFOADCLLGRVOVRFHVA	KROAEMLLCWHGRALVATS	AWRC
SAW				
*****				

FIG. 20

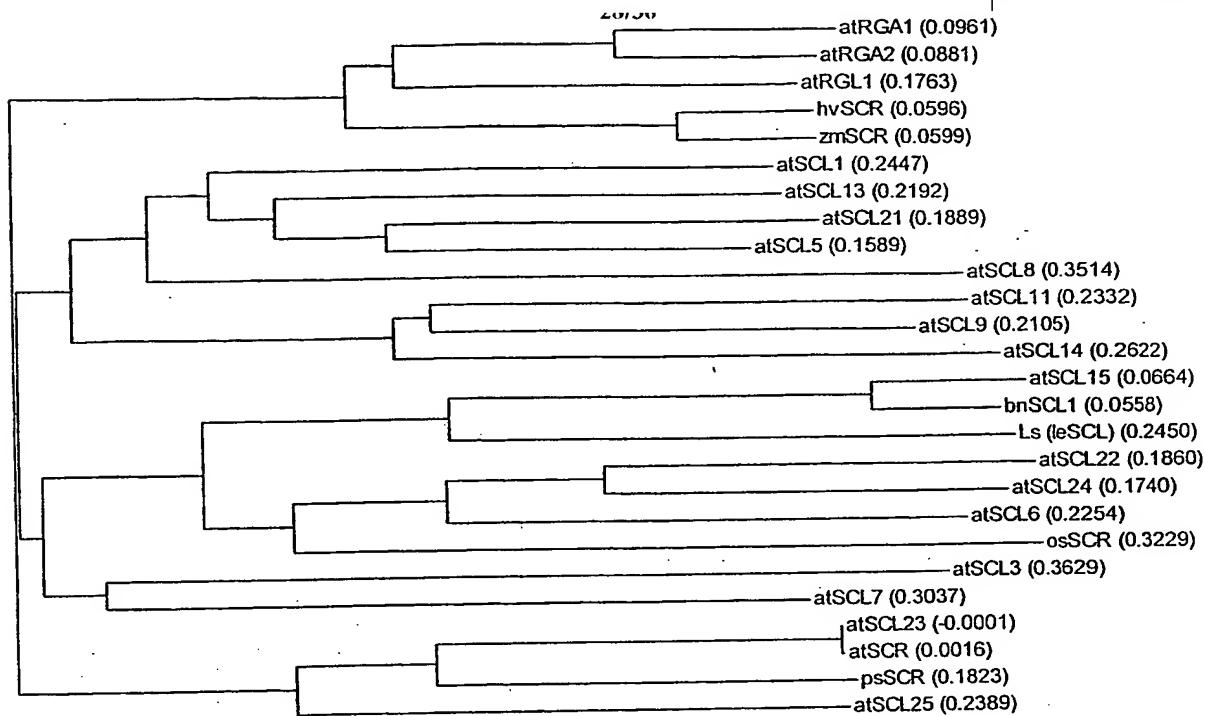
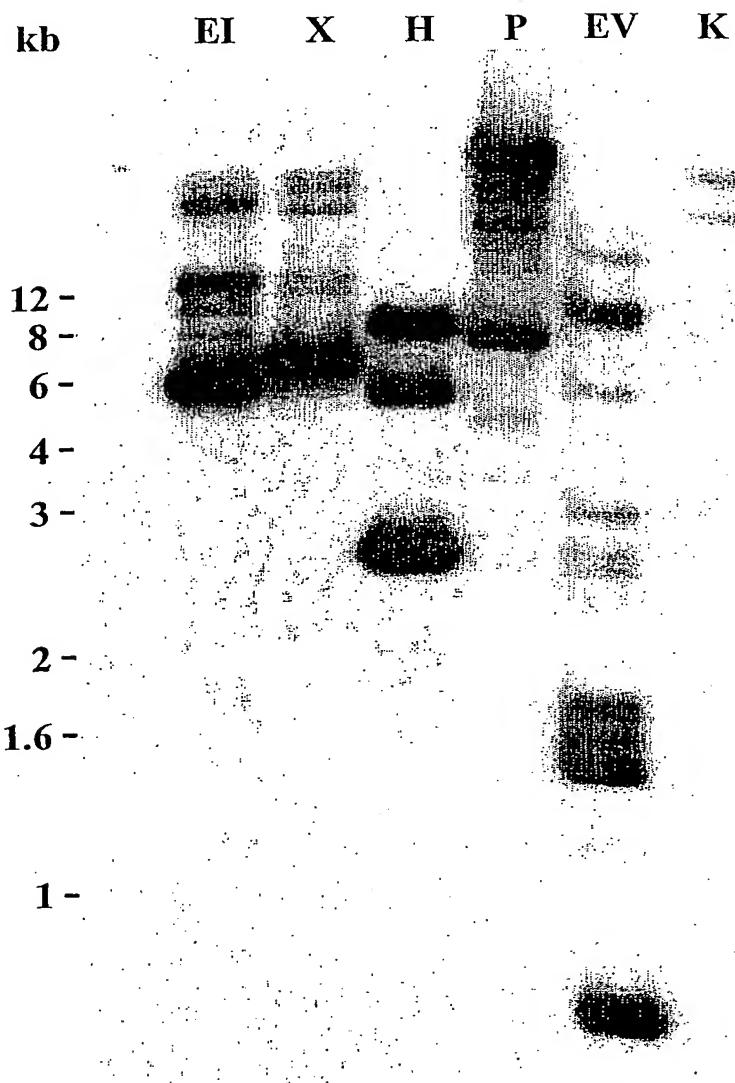
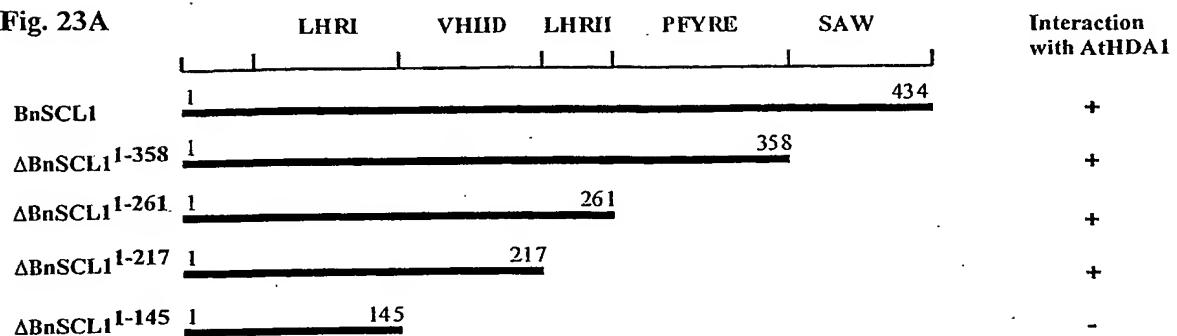
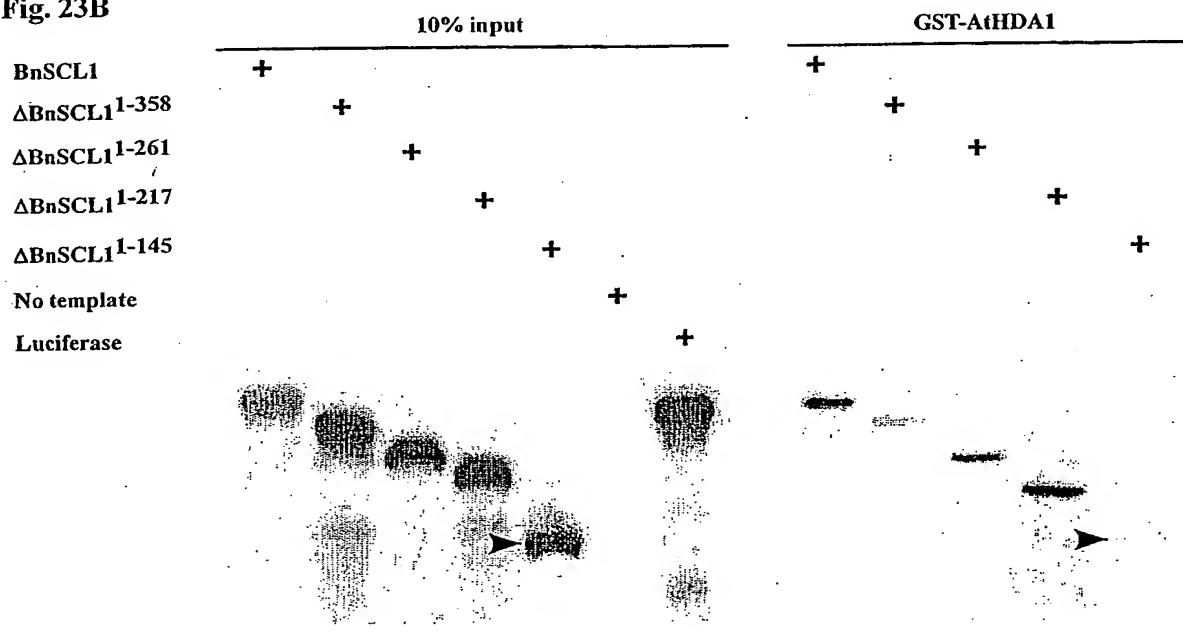


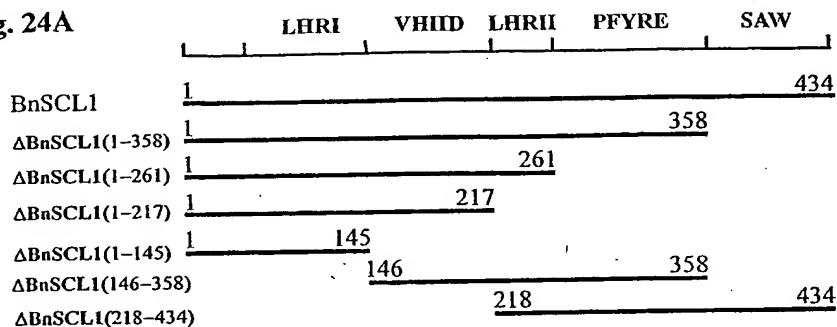
FIG. 21



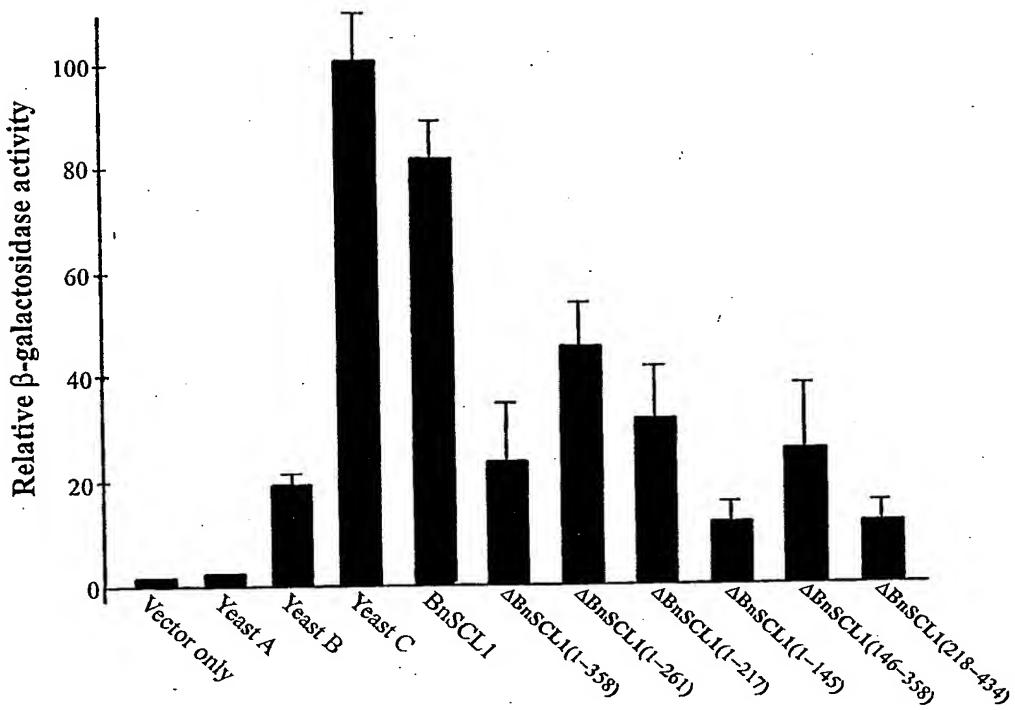
**FIG. 22**

**Fig. 23A****Fig. 23B****FIG. 23**

**Fig. 24A**



**Fig. 24B**



**FIG. 24**

Fig. 25A

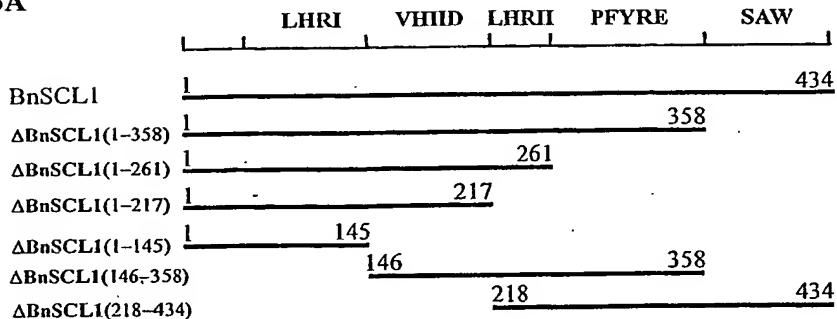


Fig. 25B

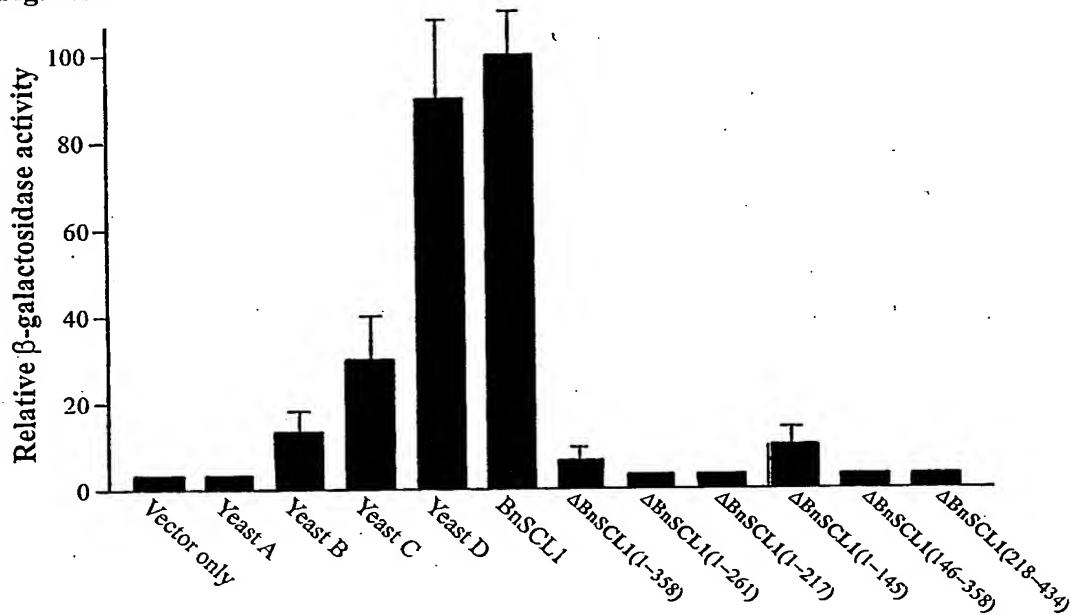


FIG. 25

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FACTORS  
Attorney Name: Gregory A. Sebald  
Phone No.: 612.336.4728  
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Fig. 26A



Fig. 26B

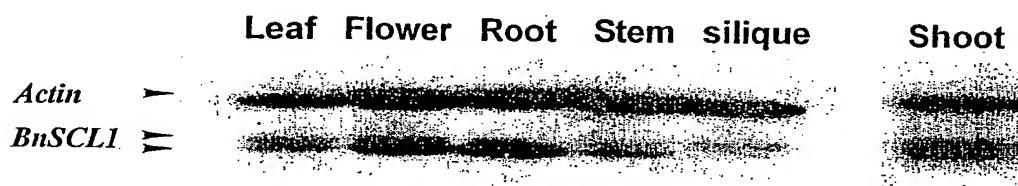


FIG. 26

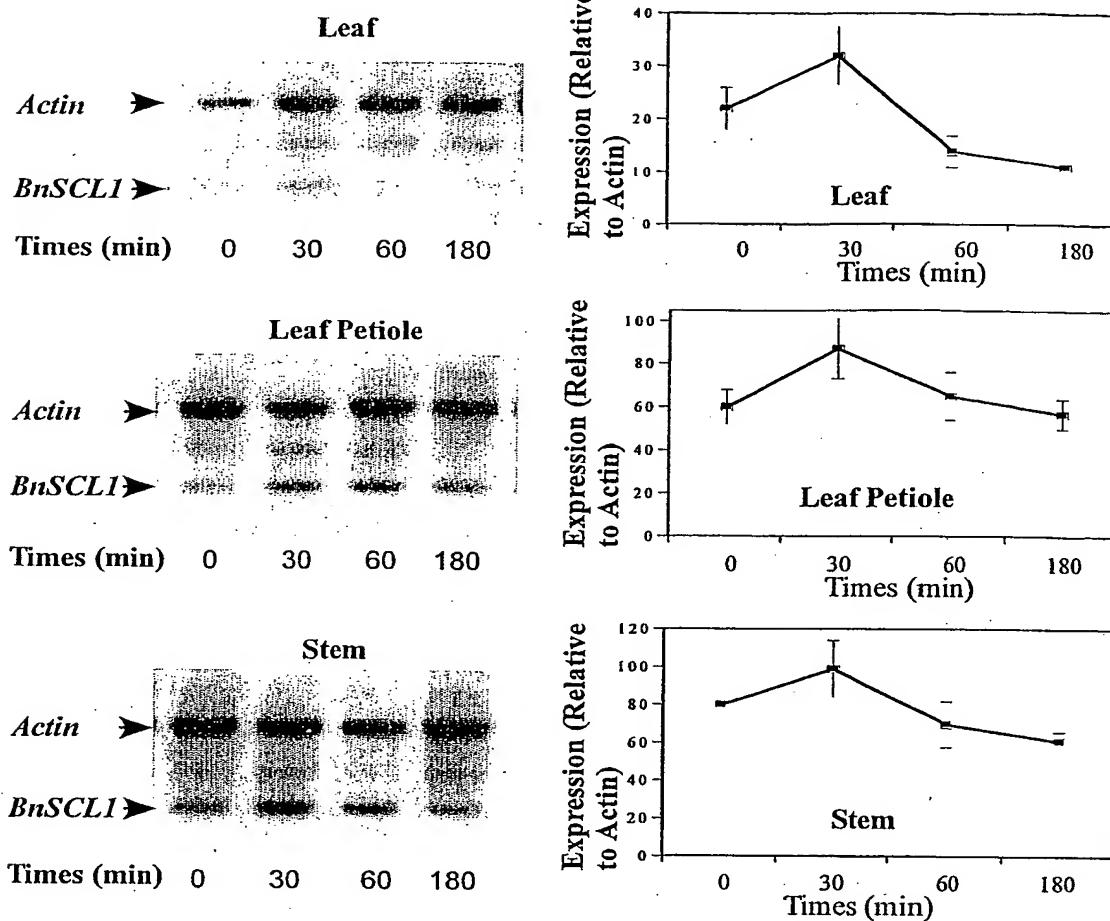
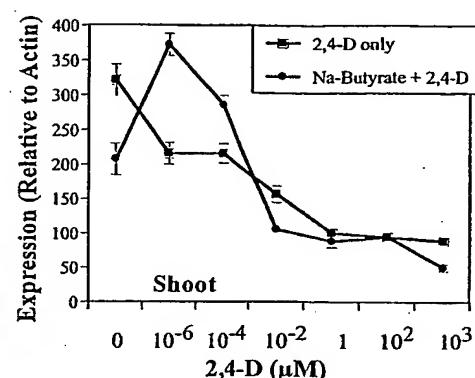
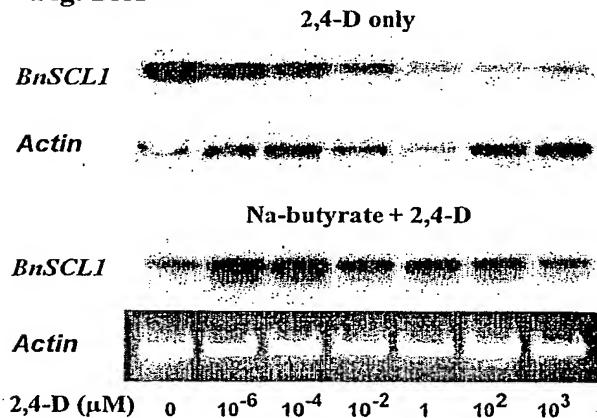


FIG. 27

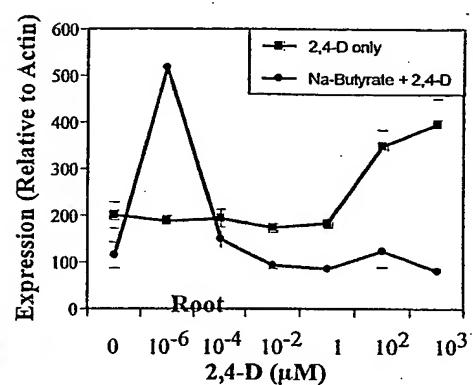
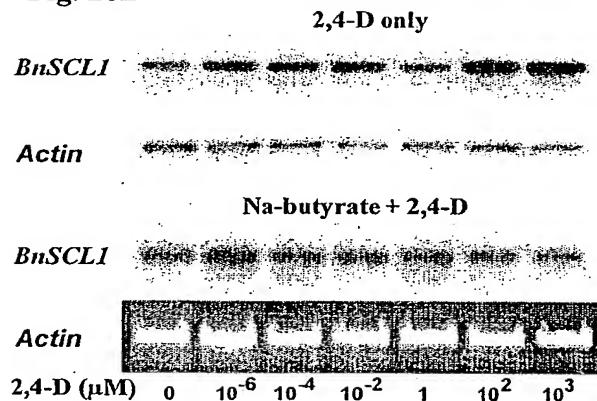
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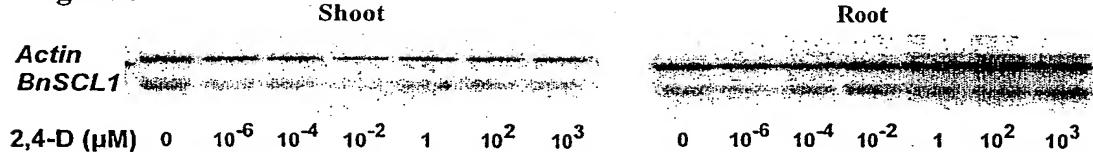
**Fig. 28A**



**Fig. 28B**

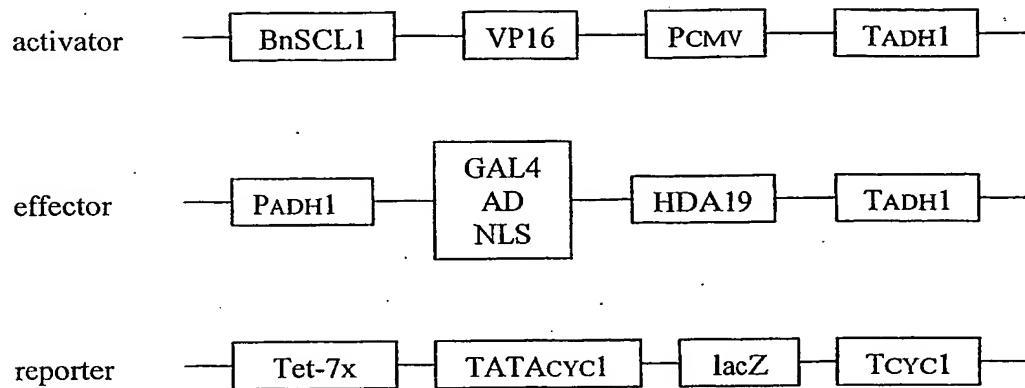


**Fig. 28C**

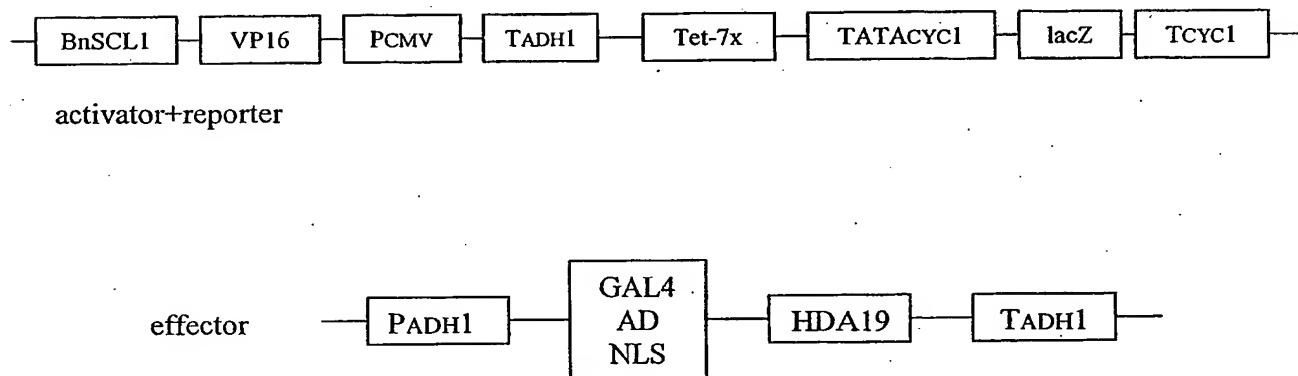


**FIG. 28**

**Fig. 29A**



**Fig. 29B**



**FIG. 29**

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